

## **REMARKS**

This is a full and timely response to the Office Action of May 13, 2009.

Reconsideration and allowance of the application and all presently pending claims are respectfully requested.

Upon entry of this Response, claims 8-21 are pending in this application. Claim 11 is amended to correct a typographical error. Claims 1-7 have been canceled. The prior art made of record has been considered, but is not believed to affect the patentability of the presently pending claims. Applicants believe that no new matter has been added by the amendments and that a new search is not necessary.

Applicants thank the Examiner for removing the 102 rejection. Applicants traverse the pending rejections and the response to arguments.

## **CLAIMS**

### **Claim 8**

Claim 8 is rejected under 35 U.S.C. §103(a) as purportedly being unpatentable over Choi (U.S. Patent Application 2002/0094496) in view of Jacobson (U.S. 6,517,995), as described in the Office Action.

Applicants traverse the 103 rejections in the Office Action and submit that the rejection of claim 8 under 35 U.S.C. §103 in view of Choi and Jacobson should be withdrawn because the references, individually or in combination, do not teach, disclose, or suggest each and every feature of claim 8 above. In particular, Applicants agree with the Office that Choi does not teach, disclose, or suggest that "...removing the stamp mask; and curing the polymer material after the stamp mask is removed" as recited in claim 8. The Office attempts to cure this deficiency of Choi using Jacobson.

Choi teaches that the polymer material, a liquid, having a viscosity of about 0.01 to 100 cps (See paragraph [0101]). Then, the liquid is cured while the template is disposed on the polymer material so that the polymer material can “harden and assume the shape of the space define by the gap” as noted on Page 4, paragraph [0082]. If the template is removed prior to curing, the liquid polymer material would not form the shape of the space defined by the gap. Choi notes that the advantage of using a liquid is to eliminate the use of high temperatures and high pressures associated with prior art references (See, Page 4 paragraph [0085]). Thus, Choi clearly teaches away from amended claim 8.

The Office attempts to cure this deficiency using Jacobson. Jacobson notes that a liquid may retain a pattern when a stamp is removed. However, it should be noted that the liquid used in Jacobson has a much higher viscosity than the liquid used in Choi (See column 3, lines 49-51, and Dow Corning website for SYLGARD-184 which has a viscosity of 3900 cps). Thus, Choi and Jacobson clearly are using completely different “liquids.” Also, Jacobson teaches soft lithography (e.g., elastomer stamp), while Choi teaches the use of rigid templates. Thus, stating that this is merely a rearrangement of process steps is not appropriate. One of skill in the art would not only consider reconsider rearranging steps but would also consider the liquid used and the components to form structures, as well as other parameters of the components. In addition to using a much higher viscosity liquid than Choi, Jacobson notes that the thickness of the liquid must be sufficiently small, the contact angle between the liquid and the substrate is small, and that there is a sufficient surface energy mismatch between the stamp and the liquid so that the liquid is not withdrawn upon removal of the

stamp. At least these issues noted in Jacobson must be addressed by the Office to assert that the combination would be recognized by one skilled in the art to yield the same result.

Applicants assert the skilled artisan would not expect a fluid to retain its shape upon removal of the stamp unless the “liquid” was highly viscous. One skilled in the art would recognize that although a high viscosity liquid may retain its shape when the stamp is removed as shown in Jacobson, the liquid used in Choi will not likely retain its shape upon removal since the viscosity is a factor of 40 different. One skilled in the art would not assume that a low viscosity liquid will retain its shape when the stamp is removed.

In addition, one skilled in the art would also need to investigate the contact angles between the liquid and the substrate. It should be noted that the artisan would first note that the stamp in Choi does not contact the substrate so that the stamp is against the substrate. As a result, Choi does not provide any teaching, disclosure, or suggestion regarding contact angles between the liquid and the substrate. The artisan would have to engage in an inordinate amount of experimentation to determine if Choi can be modified so that the stamp can be placed against the substrate and the resulting contact angles.

Furthermore, the artisan would need to investigate that there is a sufficient surface energy mismatch between the stamp and the liquid so that the liquid is not withdrawn upon removal of the stamp. Choi is not concerned about having a sufficient surface energy mismatch between the stamp and the liquid since Choi does not remove the stamp prior to curing. The artisan would have to engage in an inordinate amount of

experimentation to determine if such surface energy mismatches exist and if the removing the stamp would not withdraw liquid into the area where the stamp occupied prior to removal. Choi does not provide any teaching, disclosure, or suggestion regarding surface energies mismatches.

For at least the reasons noted above, the rejection of claim 8 should be withdrawn.

As the Supreme Court recently stated, “rejections on obviousness cannot be sustained by mere conclusory statements,” and “there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR Int’l v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007). Instead of a reasoning with a rational underpinning, however, the Office Action offers only a conclusory statement.

What is missing is an explanation of why the skilled artisan would consider Choi’s and Jacobson’s actual teachings, and ignore its patentable differences, in order to produce exactly the features recited in claim 8. An analysis of pertinent factors to determine obviousness requires that there be an assessment of the ordinary skill in the art, and the differences between the prior art and the claimed subject matter, a determination of the scope and content of the prior art (e.g., *In re Winslow*, 365 F.2d 1017, 151 U.S.P.Q. (BNA) 48 (C.C.P.A. 1966), and a look at secondary considerations, or objective indicia (e.g., failed efforts of others, copying by others, praise for the invention, long-felt but unsolved need, teaching away from the invention, and commercial success). *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 86 S.Ct. 684 (1966). The Office only notes that one of skill in the art would have the knowledge

that altering Choi in view of Jacobson is merely a rearrangement of process steps, and then notes that such a change would yield predictable results. However, as noted above, the Office has completely ignored that Choi and Jacobson use different viscosity polymers and the Jacobson teaches that the fluid would retain its shape under certain conditions. The Office just notes it would be obvious to make the changes to Choi in view of Jacobson. In order to make such leaps in logic, the skilled artisan would be required to ignore teachings of each of Choi and Jacobson and infer teachings which simply do not exist. Put simply, neither the Office Action nor the reference itself explain how the skilled artisan could, in light of the differences of the cited reference, arrive at precisely the features of claim 8. No explanation is given, therefore no *prima facie* obviousness is established. Applicants respectfully request the rejection to claim 8 be withdrawn.

Applicants request that if the rejection is maintained, the Office consider that the cited references can not be combined if the invention of Hu would be inoperable when combined with Jacobson. If proposed modifications render a reference unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Rearranging the process steps as suggested by the Office would render Hu inoperable since the liquid would flow away from the stamp. Hu clearly indicates that the stamp is in place when curing is performed. Removing the stamp prior to curing, as suggested by the Office, would render Hu inoperable for its intended purpose. Thus, for at least this reason the rejection of claim 8 should be withdrawn.

As a result, claim 8 is allowable over the cited references.

### **Claims 9-13**

Applicants traverse the §102 and 103 rejections in the Office Action. Applicants respectfully submit that pending dependent claims 9-13 include every feature of independent claim 8 and that the cited references fail to teach, disclose, or suggest at least the features of claim 8. Thus, pending dependent claims 9-13 are also allowable over the prior art of record. *In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988).

Notwithstanding the arguments above, the cited references do not teach the features of claim 12. In particular, the cited references do not teach, disclose or suggest “forming a polymer structure having the physical feature” as recited in claim 12. Thus, for at least this reason, claim 12 should be allowed.

### **Claim 14**

Claim 14 is rejected under 35 U.S.C. §103(a) as purportedly being anticipated by Choi (U.S. Patent Application 2002/0094496) in view of Jacobson (U.S. 6,517,995) and in view of Canavello (U.S. Patent 4,379,833), as described in the Office Action.

Applicants traverse the 103 rejections in the Office Action and submit that the rejection of claim 8 under 35 U.S.C. §103 in view of Choi, Jacobson, and Canavello should be withdrawn because the references, individually or in combination, do not teach, disclose, or suggest each and every feature of claim 8 above. In particular, Applicants agree with the Office that Choi does not teach, disclose, or suggest that “...removing the stamp mask; and curing the polymer material after the stamp mask is removed” as

recited in claim 14. The Office attempts to cure this deficiency of Choi using Jacobson and Canavello.

Choi teaches that the polymer material, a liquid, having a viscosity of about 0.01 to 100 cps (See paragraph [0101]). Then, the liquid is cured while the template is disposed on the polymer material so that the polymer material can “harden and assume the shape of the space define by the gap” as noted on Page 4, paragraph [0082]. If the template is removed prior to curing, the liquid polymer material would not form the shape of the space defined by the gap. Choi notes that the advantage of using a liquid is to eliminate the use of high temperatures and high pressures associated with prior art references (See, Page 4 paragraph [0085]). Thus, Choi clearly teaches away from amended claim 14.

The Office attempts to cure this deficiency using Jacobson. Jacobson notes that a liquid may retain a pattern when a stamp is removed. However, it should be noted that the liquid used in Jacobson has a much higher viscosity than the liquid used in Choi (See column 3, lines 49-51, and Dow Corning website for SYLGARD-184 which has a viscosity of 3900 cps). Thus, Choi and Jacobson clearly are using completely different “liquids.” Also, Jacobson teaches soft lithography (e.g., elastomer stamp), while Choi teaches the use of rigid templates. Thus, stating that this is merely a rearrangement of process steps is not appropriate. One of skill in the art would not only consider reconsider rearranging steps but would also consider the liquid used and the components to form structures, as well as other parameters of the components. In addition to using a much higher viscosity liquid than Choi, Jacobson notes that the thickness of the liquid must be sufficiently small, the contact angle between the liquid

and the substrate is small, and that there is a sufficient surface energy mismatch between the stamp and the liquid so that the liquid is not withdrawn upon removal of the stamp. At least these issues noted in Jacobson must be addressed by the Office to assert that the combination would be recognized by one skilled in the art to yield the same result.

Applicants assert the skilled artisan would not expect a fluid to retain its shape upon removal of the stamp unless the “liquid” was highly viscous. One skilled in the art would recognize that although a high viscosity liquid may retain its shape when the stamp is removed as shown in Jacobson, the liquid used in Choi will not likely retain its shape upon removal since the viscosity is a factor of 40 different. One skilled in the art would not assume that a low viscosity liquid will retain its shape when the stamp is removed.

In addition, one skilled in the art would also need to investigate the contact angles between the liquid and the substrate. It should be noted that the artisan would first note that the stamp in Choi does not contact the substrate so that the stamp is against the substrate. As a result, Choi does not provide any teaching, disclosure, or suggestion regarding contact angles between the liquid and the substrate. The artisan would have to engage in an inordinate amount of experimentation to determine if Choi can be modified so that the stamp can be placed against the substrate and the resulting contact angles.

Furthermore, the artisan would need to investigate that there is a sufficient surface energy mismatch between the stamp and the liquid so that the liquid is not withdrawn upon removal of the stamp. Choi is not concerned about having a sufficient

surface energy mismatch between the stamp and the liquid since Choi does not remove the stamp prior to curing. The artisan would have to engage in an inordinate amount of experimentation to determine if such surface energy mismatches exist and if the removing the stamp would not withdraw liquid into the area where the stamp occupied prior to removal. Choi does not provide any teaching, disclosure, or suggestion regarding surface energies mismatches.

As the Supreme Court recently stated, “rejections on obviousness cannot be sustained by mere conclusory statements,” and “there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR Int'l v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007). Instead of a reasoning with a rational underpinning, however, the Office Action offers only a conclusory statement

What is missing is an explanation of why the skilled artisan would consider Choi’s and Jacobson’s actual teachings, and ignore its patentable differences, in order to produce exactly the features recited in claim 14. An analysis of pertinent factors to determine obviousness requires that there be an assessment of the ordinary skill in the art, and the differences between the prior art and the claimed subject matter, a determination of the scope and content of the prior art (e.g., *In re Winslow*, 365 F.2d 1017, 151 U.S.P.Q. (BNA) 48 (C.C.P.A. 1966), and a look at secondary considerations, or objective indicia (e.g., failed efforts of others, copying by others, praise for the invention, long-felt but unsolved need, teaching away from the invention, and commercial success). *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 86 S.Ct. 684 (1966). The Office only notes that one of skill in the art would have the knowledge

that altering Choi in view of Jacobson is merely a rearrangement of process steps, and then notes that such a change would yield predictable results. However, as noted above, the Office has completely ignored that Choi and Jacobson use different viscosity polymers and the Jacobson teaches that the fluid would retain its shape under certain conditions. The Office just notes it would be obvious to make the changes to Choi in view of Jacobson. In order to make such leaps in logic, the skilled artisan would be required to ignore teachings of each of Choi and Jacobson and infer teachings which simply do not exist. Put simply, neither the Office Action nor the reference itself explain how the skilled artisan could, in light of the differences of the cited reference, arrive at precisely the features of claim 14. No explanation is given, therefore no *prima facie* obviousness is established. Applicants respectfully request the rejection to claim 14 be withdrawn.

Applicants request that if the rejection is maintained, the Office consider that the cited references can not be combined if the invention of Hu would be inoperable when combined with Jacobson. If proposed modifications render a reference unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Rearranging the process steps as suggested by the Office would render Hu inoperable since the liquid would flow away from the stamp. Hu clearly indicates that the stamp is in place when curing is performed. Removing the stamp prior to curing, as suggested by the Office, would render Hu inoperable for its intended purpose. Thus, for at least this reason the rejection of claim 14 should be withdrawn.

As a result, claim 14 is allowable over the cited references.

## **Claims 15-21**

Applicants traverse the §102 and 103 rejections in the Office Action. Applicants respectfully submit that pending dependent claims 15-21 include every feature of independent claim 14 and that the cited references fail to teach, disclose, or suggest at least the features of claim 14. Thus, pending dependent claims 15-21 are also allowable over the prior art of record. In re Fine, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988).

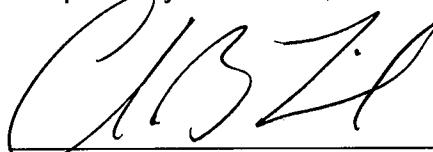
## Conclusion

In light of the foregoing amendments and for at least the reasons set forth above, Applicants respectfully submit that all objections and/or rejections have been traversed, rendered moot, and/or accommodated. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested.

In addition, any other statements in the Office Action that are not explicitly addressed herein are not intended to be admitted. In addition, any and all findings of inherency are traversed as not having been shown to be necessarily present. Furthermore, any and all findings of well-known art and official notice, or statements interpreted similarly, should not be considered well known since the Office Action does not include specific factual findings predicated on sound technical and scientific reasoning to support such conclusions.

If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

Respectfully submitted,



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Docket No.: 62020-1290